ELEC 419: Innovation Lab in Mobile Health

Course Syllabus
Spring 2015

Course Instructors: Ashutosh Sabharwal, Ashok Veeraraghavan and Ray Simar
Department of Electrical and Computer Engineering

Credits: 3

Course Schedule: 6:30 - 9pm, Wednesday, Duncan Hall 3076

Grading: The course grading uses a combination of the following

1. Two instructor evaluation - mid-term and final.
2. Grade on final report and project video.
3. One mid-semester self-evaluation by students, where they answer a questionnaire about their personal progress and assign themselves a grade.
4. One peer-evaluation of their own team members
5. Multiple evaluations by invited speakers (as explained above)
6. Two external panels for mid-term and final grading.

Class Participation: Students are expected to attend both class lecture and are encouraged to ask questions during course meetings throughout the semester.

Course Objective: At the end of the course, the students should be able to

1. Understand a healthcare or wellness challenge
2. Identify the core elements for a new solution
3. Develop prototype solutions
4. Present their project pitches to established entrepreneurs from other startups

Course Methodology: The semester-length course is inspired by multiple well-established methods, and is a step in teaching the students the fundamentals of entrepreneurship.

1. To understand the healthcare challenge, the students use evidence-based entrepreneurship methodology, that is now part of NSF I-Corps. In this case, hypothesis about market needs and customer pain points are developed, and potential customers are interviewed. Customer interviews serve as the data that is used to negate, support or refine the hypothesis.

2. To identify the core elements, again customer interviews provide the data necessary to identify the most important product features. That allows the teams to identify Minimal Viable Product (MVP).
3. To develop prototype solutions, the teams use any available resource (hardware/software) to build MVP and then show it to the select customers for feedback. The feedback is used to adapt the product iteratively.
4. As a key aspect of student training, the students make increasing more refined project pitches at each stage of the project. Each week, they have different project tasks.

Course Specifics:

1. The class is divided into teams within the first week. All teams have either 2 but preferably 3 participants.
2. Cross-year and cross-expertise teams are encouraged. The course is open to both undergraduate and graduate students. All engineerings students can register, but ECE, CS and BioE students prefer to take the class.
3. Multiple speakers from actual healthcare startups are invited to share their experience in starting a company. All students make a pitch to the invited speakers, treating them as potential investors.

Course Material: A fair amount of course is hands-on training. Following course materials provide basics for conducting customer interviews and using customer interview based data analysis.

1. (Book) “Talking to Humans,” Giff Constable. (pdf available free online)
2. (Online Material) Lean Startups by Steve Blank, Course material available for free at https://www.udacity.com/course/ep245
3. (Online Material) Y-Combinator Startup Course http://www.wired.com/2014/09/now-can-take-free-y-combinator-startup-course-online/
4. (Book) “Hooked: how to build habit-forming products,” Nir Eyal with Ryan Hoover.
5. (Instructor Lectures) Lecture notes by instructors.

Course Website:
http://owlspace.rice.edu/ We will be using Owlspace for assignments and lab projects and announcements. Also class notes and readings will be posted to the Owlspace site.

Prerequisites: ECE, CS and BioE Juniors and above have sufficient pre-requistes.

Course Status: Elective for majors in Electrical and Computer Engineering.

Course Outcomes: Related to ABET Criterion 3 a through k:

The relationships to eleven criteria are listed with 1, 2, and 3. (with 3 as most related.)

a	An ability to apply knowledge of mathematics, science, and engineering.	3
b	An ability to design and conduct experiments, as well as to analyze and interpret data.	2
c	An ability to design a system, component, or process to meet desired needs.	3
d	An ability to function on multi-disciplinary teams.	3
e	An ability to identify, formulate, and solve engineering problems.	3
f	An understanding of professional and ethical responsibility.	
g	An ability to communicate effectively.	3
h	The broad education necessary to understand the impact of engineering solutions in a global and societal context.	1
i	A recognition of the need for, and an ability to engage in life-long learning.	
j	A knowledge of contemporary issues.	
k	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	3

Honor Code Policy: All students are required to clearly disclose what was their contribution in the project throughout the semester. If outside help, material (e.g. open-source softwares) and support was used, the students are required to clearly disclose it.

Students with Disabilities:

Any student with a disability requiring accommodations in this course is encouraged to contact the instructor after class or during office hours. Additionally, students will need to contact Disability Support Services in the Ley Student Center.

Updates to the Course:

Information contained in this course syllabus, other than the absence policies, may be subject to change with reasonable advance notice as appropriate.